Zenza BRONICA®

ETR

# AE FINDER E

ZENZA BRONICA IND., INC.

## Use of the VOM (Volt-Ohm-Milliammeter) Tester

(1) In general, the tester is used for four types of measurements of (a) DC current, (b) AC voltage, (c) DC voltage and (d) resistances.
(2) Measurements of (c) DC voltage and (d) resistance are undertaken in the repair manual.
(3) When measuring (c) DC voltage and (d) resistances, as indicated in (2), the reading must always be made between two points.
(4) One of the points (base) must always be P-9 (GND) when measuring DC voltage or, in other words, measurements are based on the ground (earth) point. Furthermore, the black-colored minus (–) test lead must always be used on the grounding terminal, in this case.
(5) In the illustration of the tester range, measurements of DC voltage must always be made within the DCV range and measurements of resistance within the ohm (Ω) range.
(6) The numerals 250, 50, 10, etc., in the DCV range, show the maximum reading that is possible at that setting.
When checking the AE circuit of the ETR camera, however, only the three settings 10, 2.5 and 0.5 are used.
(7) The resistance settings shown as x100, x1K, etc., indicate the multiplications that must be made on the indicated reading and should be read as "times one hundred", etc. In other words, the reading must be multiplied by 100 which means that a reading of 10, when set to the x100 range, will be 1,000 ohms which is equivalent to 1 kiloohm. Or, in other words, the reading will be 1, in the same case, if the tester were to be set to the x1K range.
(8) Before making the resistance test, always be sure to calibrate the tester's circuit or, in other words, touch the two test prods together and adjust the knob (with the Ω indication) to get a zero reading.

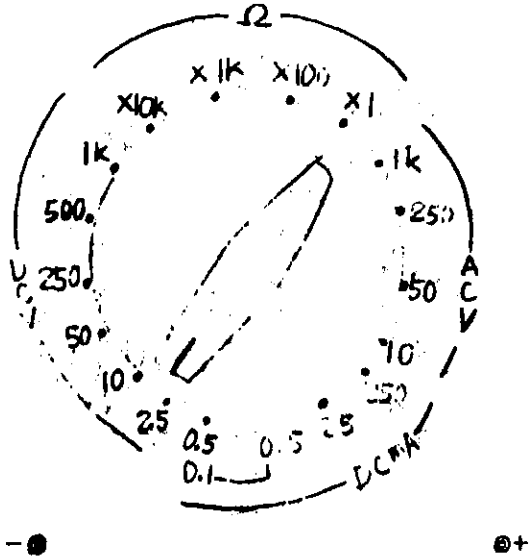
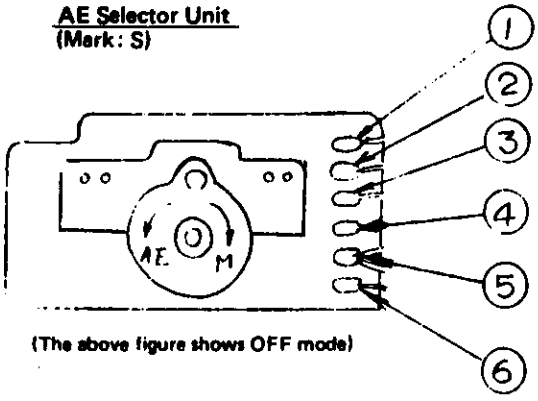



Fig-1

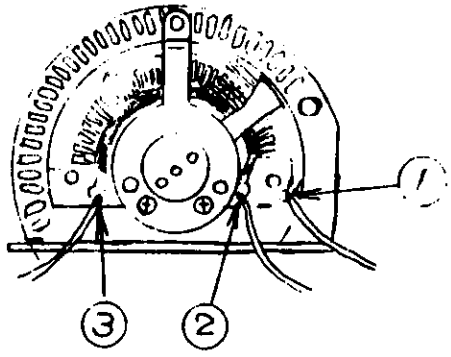
CAUTION
Extra care is required on handling of Main Circuit (A222040) such as solder iron and working bench should be properly grounded.

**AE Selector Unit**
**(Mark: S)**



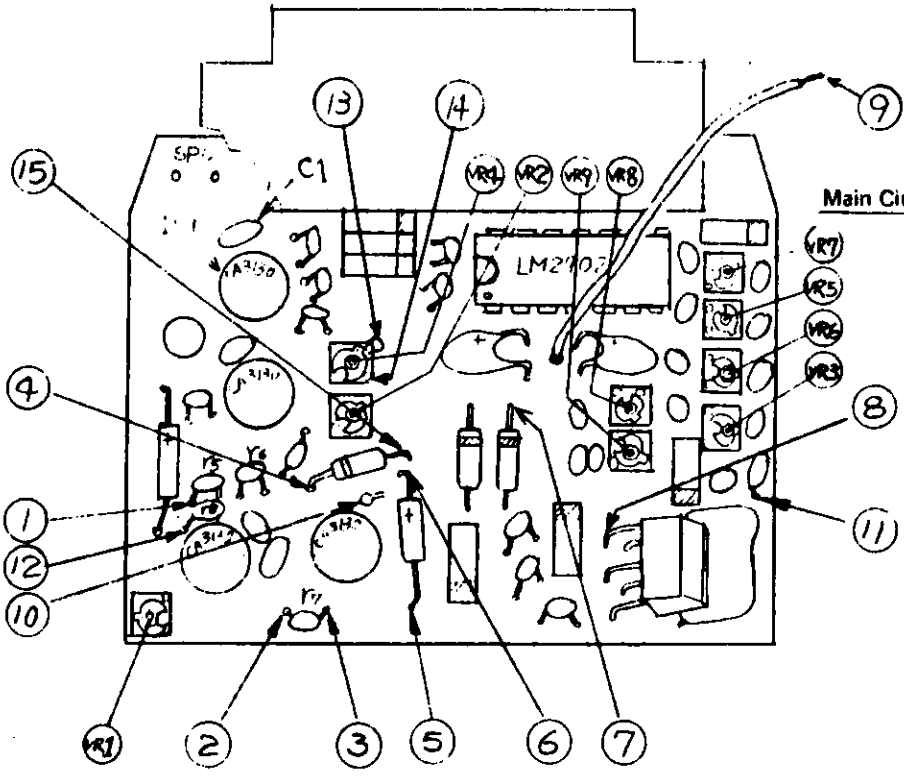

(The above figure shows OFF mode)

**ASA Base Plate (Mark: A)**




(The above figure shows ASA100 setting)

**Main Circuit (Mark: P)**




Note: (P-8) represents point 8 of Main Circuit (P), and as is the same manner (C-5) represents point 5 of AE contact pin base plate (C).

**AE Contact Pin Base Plate**
**(Mark: C)**

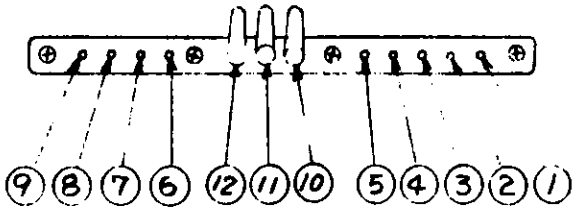



Fig-1

Wiring diagram of AE contact pin Base plate. Display Circuit & Silicon photo all.

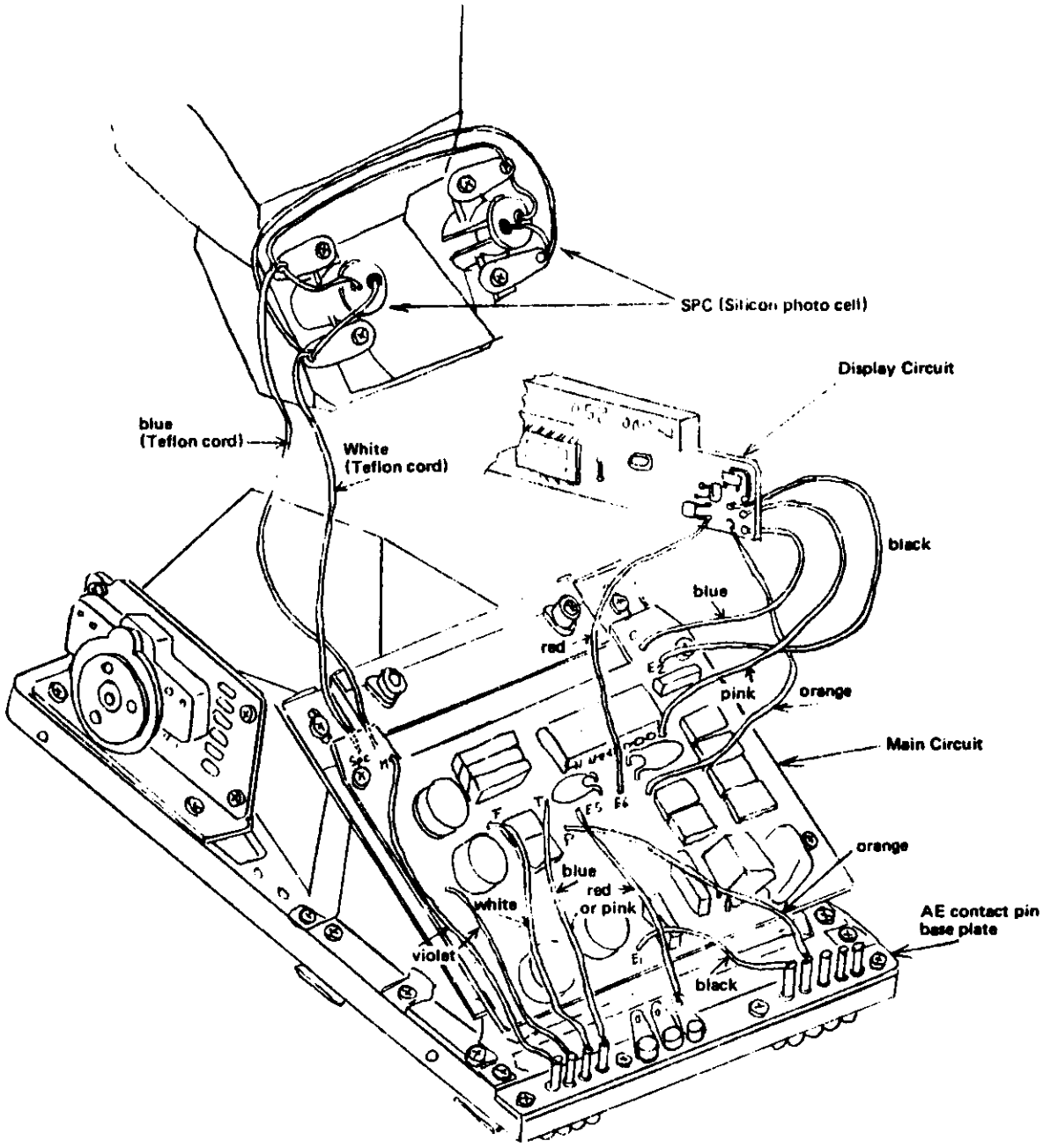
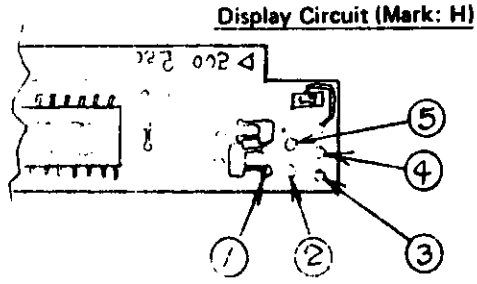



Fig-2

Display Circuit (Mark: H)



## Wiring diagram of AE selector unit & ASA dial

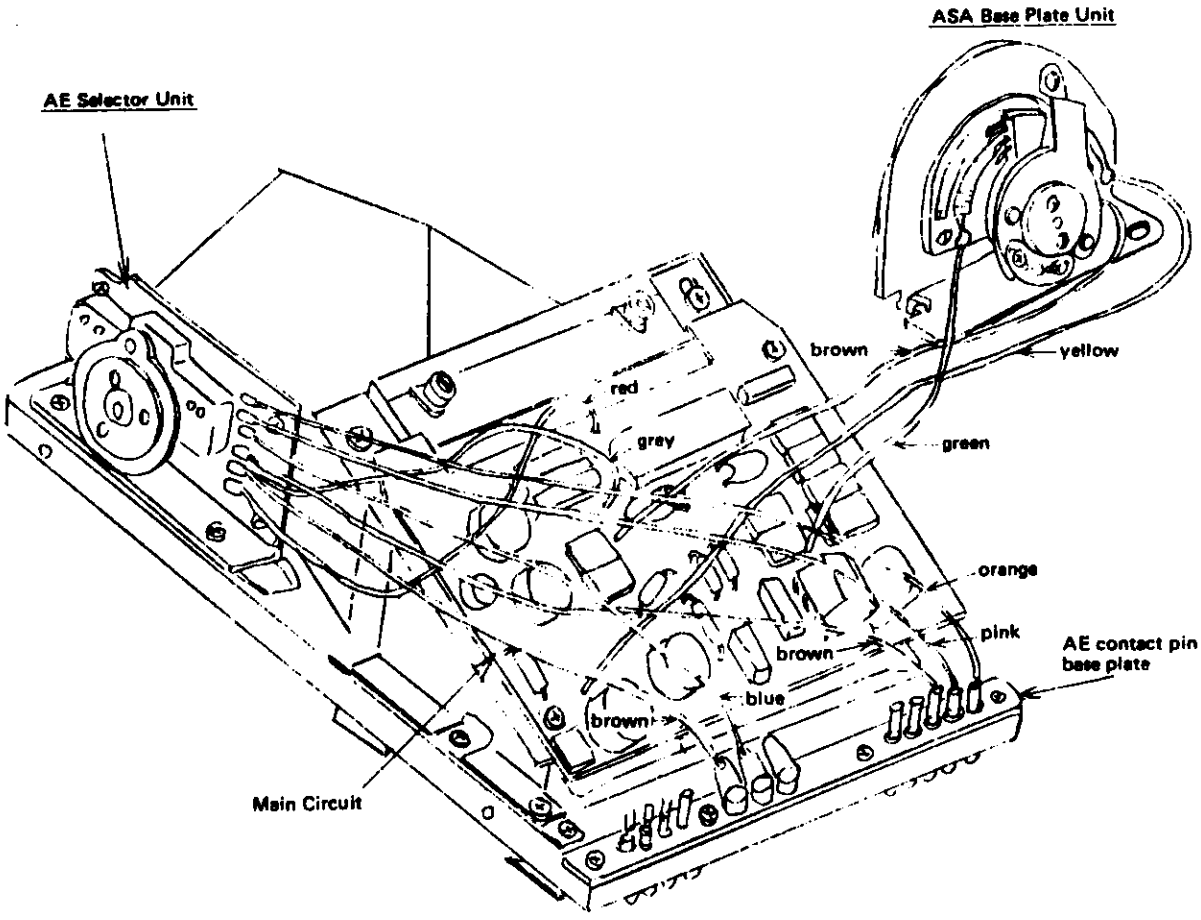
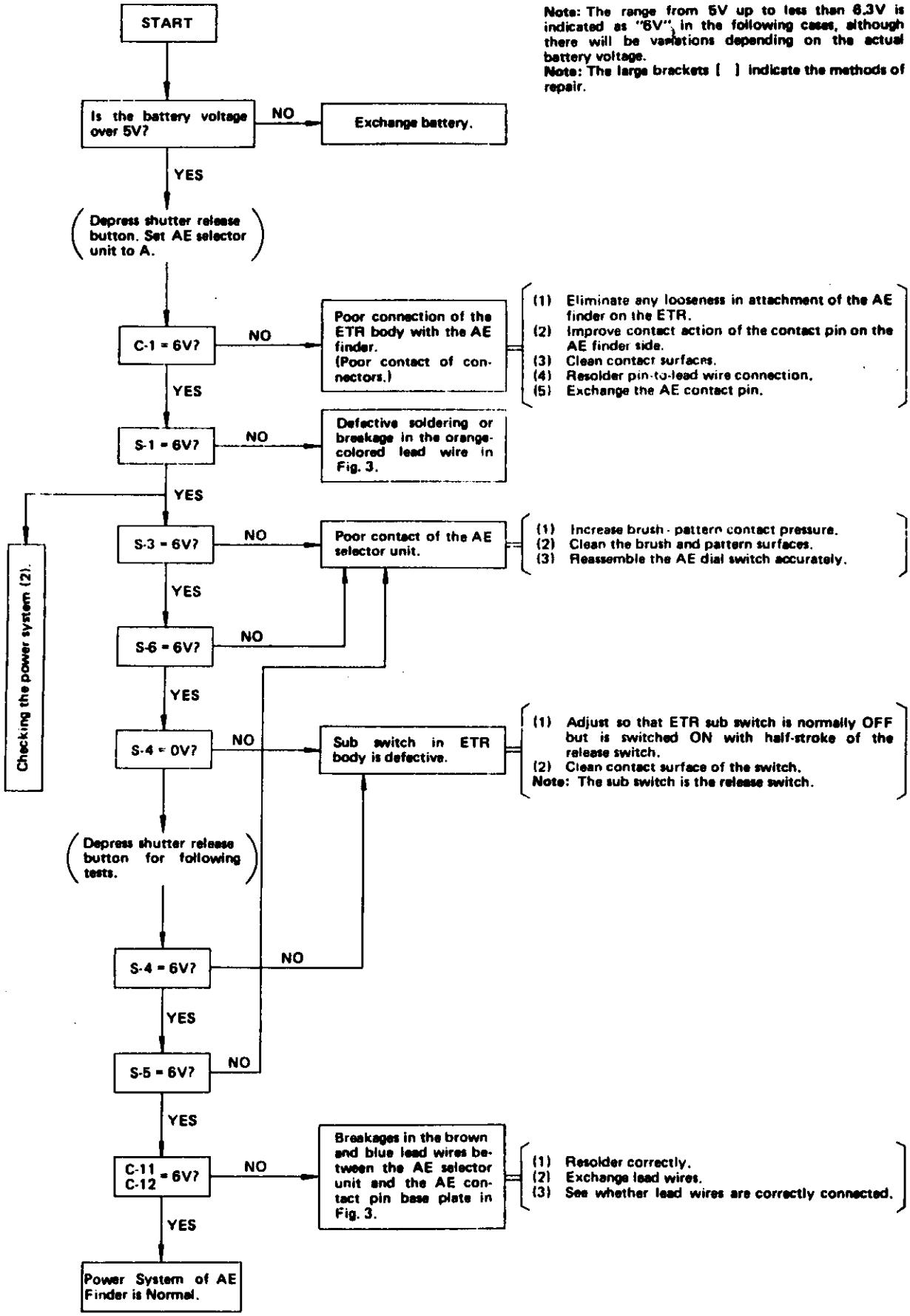


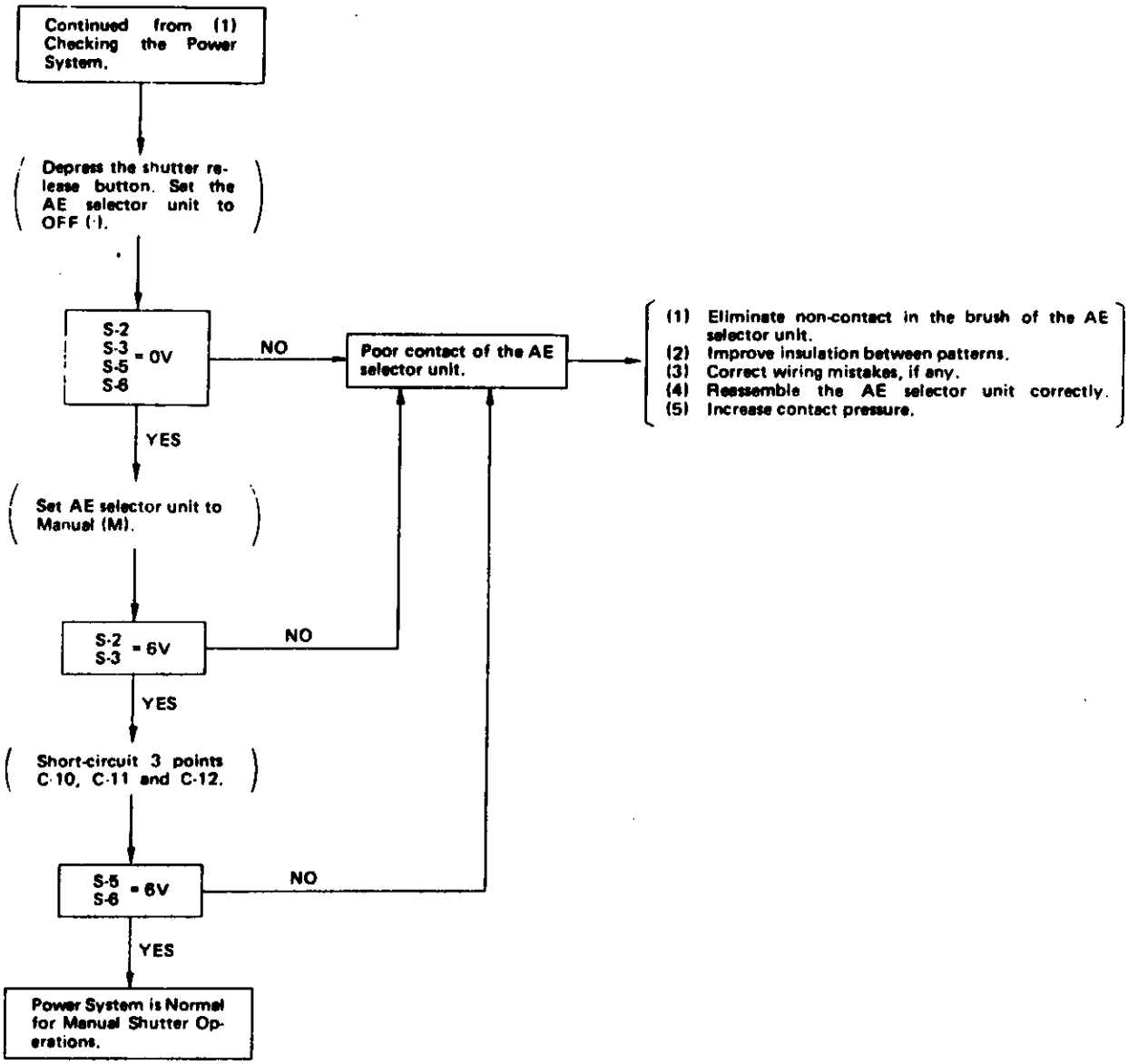

Fig-3

## (1) Checking the Power System


START
Is the battery voltage over 5V?
NO
Exchange battery.
YES
Depress shutter release button. Set AE selector unit to A.
C-1 = 6V?
NO
Poor connection of the ETR body with the AE finder. (Poor contact of connectors.)
(1) Eliminate any looseness in attachment of the AE finder on the ETR.
(2) Improve contact action of the contact pin on the AE finder side.
(3) Clean contact surfaces.
(4) Resolder pin-to-lead wire connection.
(5) Exchange the AE contact pin.
YES
S-1 = 6V?
NO
Defective soldering or breakage in the orange-colored lead wire in Fig. 3.
YES
S-3 = 6V?
NO
Poor contact of the AE selector unit.
(1) Increase brush - pattern contact pressure.
(2) Clean the brush and pattern surfaces.
(3) Reassemble the AE dial switch accurately.
YES
S-6 = 6V?
NO
YES
S-4 = 0V?
NO
Sub switch in ETR body is defective.
(1) Adjust so that ETR sub switch is normally OFF but is switched ON with half-stroke of the release switch.
(2) Clean contact surface of the switch.
Note: The sub switch is the release switch.
Checking the power system (2).
Depress shutter release button for following tests.
S-4 = 6V?
NO
YES
S-5 = 6V?
NO
YES
C-11 C-12 = 6V?
NO
Breakages in the brown and blue lead wires between the AE selector unit and the AE contact pin base plate in Fig. 3.
(1) Resolder correctly.
(2) Exchange lead wires.
(3) See whether lead wires are correctly connected.
YES
Power System of AE Finder is Normal.

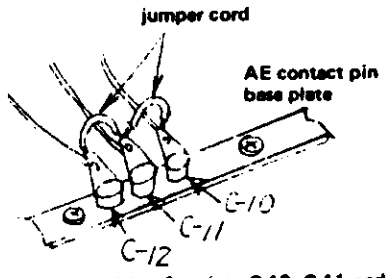
Note: The range from 5V up to less than 6.3V is indicated as "6V", in the following cases, although there will be variations depending on the actual battery voltage.
Note: The large brackets [ ] indicate the methods of repair.

## (2) Checking the Power System


Continued from (1) Checking the Power System.
Depress the shutter release button. Set the AE selector unit to OFF (·).
S-2 S-3 S-5 S-6 = 0V
NO
Poor contact of the AE selector unit.
(1) Eliminate non-contact in the brush of the AE selector unit.
(2) Improve insulation between patterns.
(3) Correct wiring mistakes, if any.
(4) Reassemble the AE selector unit correctly.
(5) Increase contact pressure.
YES
Set AE selector unit to Manual (M).
S-2 S-3 = 6V
NO
YES
Short-circuit 3 points C-10, C-11 and C-12.
S-5 S-6 = 6V
NO
YES
Power System is Normal for Manual Shutter Operations.

## (3) Checking the AUTO Exposure System

Set the AE selector unit to AE. Manipulate the winding crank on the body. Short-circuit 3 points C-10, C-11 and C-12 on the AE contact pin base plate.




Note: Short-circuiting 3 points C-10, C-11 and C-12 will connect all circuits to the power source.

**Checking the Logarithmic Compression Amplifier**

P10 = 6V — NO → Repeat (1) and (2) Checking the Power System.

YES

*1
C-9 = 0.3 - 0.6V
Are there any changes in the voltage with changes in the brightness of the light falling on the silicon photo cells?
(Increases in brightness should result in voltage increases.)

NO (0V or more than 0.6V) → Breakage, short-circuiting, poor soldering connections, mistaken wiring in the white and blue Teflon wires from the silicon photo cells or short-circuiting of C1 and IC1 in Fig. 1.

YES

**Checking the Memory Circuit**

C-8 = 0.3 - 0.6V
Does voltage change with same operations noted in *1?

NO (C-9 = 0V; C-9 > 0.6V) →
(1) Defective memory switch.
(2) Poor contact of AE contact pin base plate.
(3) Breakage in purple lead wire in Fig. 2.

YES

P-1 = 0.3 - 0.6V
Repeat same operations as *1.

NO →
(1) Adjust brush so that memory switch is ON normally but OFF with half-stroke of shutter release.
(2) Resolder improper connection of purple lead wire.
(3) Clean AE contact pin base plate.

YES

**Checking the Operational Amplifier**

P-3 = 2V ± 0.3V

NO →

YES

P-2 = 0.6 ± 0.1

NO → Improper adjustment of VR1.
(1) Set tester to DC 2.5V - 5V range.
(2) If adjustment is not possible by rotating VR1, it is defective.

YES

Note: If adjustment is not possible due to looseness or poor contact of the VR1, then exchange the main circuit.

**Checking ASA Film Speeds and F/numbers.**

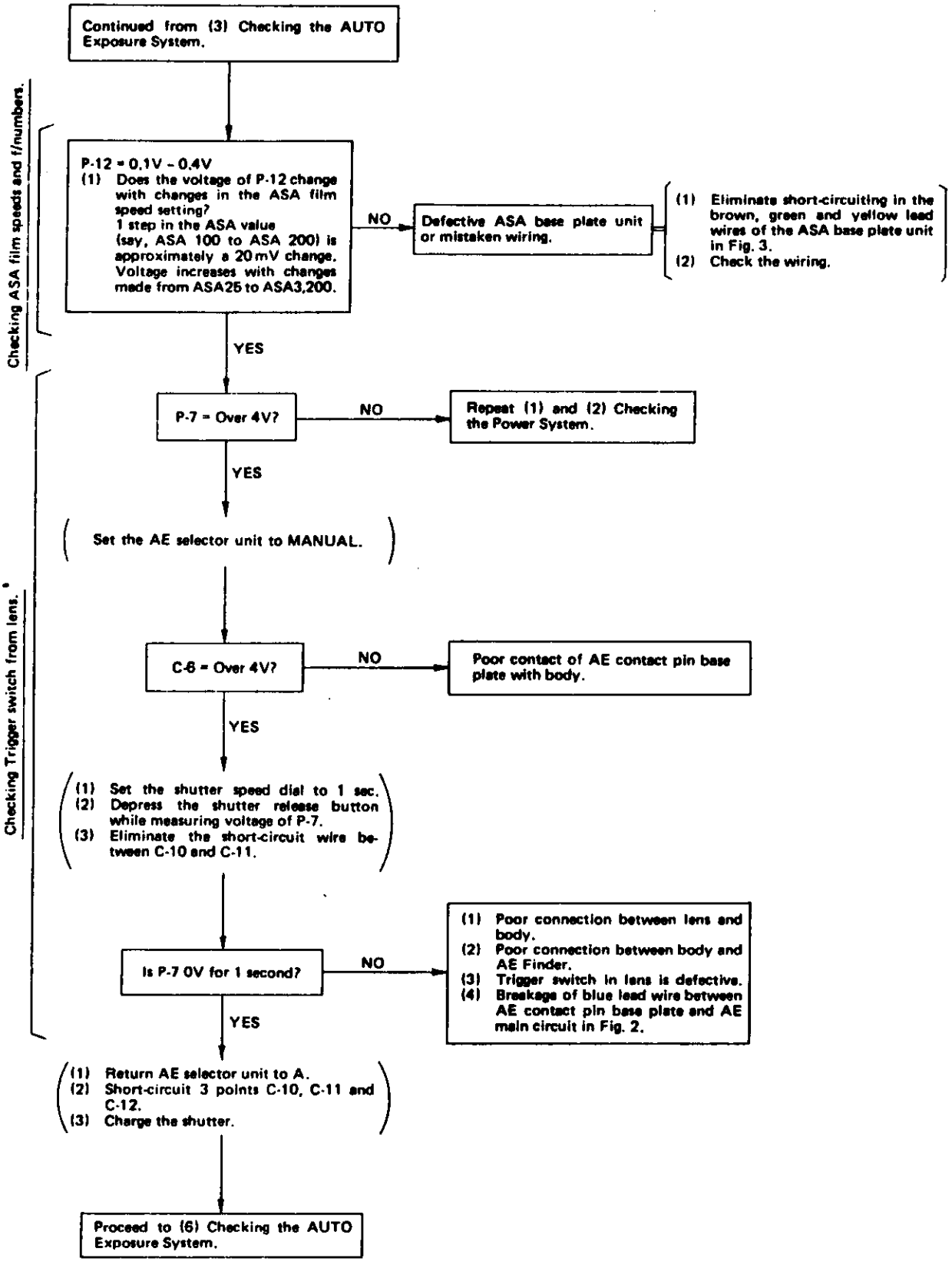
*2
P-12 = 0.1V - 0.4V
(1) Does voltage of P-12 change when the F/number of lens is changed? 1 stop is approx. 20 mV
Voltage increases with changes from F22 to F2.8.

NO → Proceed to (5) Checking the AUTO Exposure System.

YES

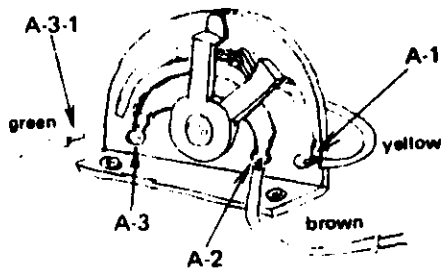
Proceed to (4) Checking the AUTO Exposure System.

## (4) Checking the AUTO Exposure System


Continued from (3) Checking the AUTO Exposure System.
Checking ASA film speeds and f/numbers.
P-12 = 0.1V - 0.4V
(1) Does the voltage of P-12 change with changes in the ASA film speed setting?
1 step in the ASA value (say, ASA 100 to ASA 200) is approximately a 20 mV change. Voltage increases with changes made from ASA25 to ASA3,200.
NO
Defective ASA base plate unit or mistaken wiring.
(1) Eliminate short-circuiting in the brown, green and yellow lead wires of the ASA base plate unit in Fig. 3.
(2) Check the wiring.
YES
P-7 = Over 4V?
NO
Repeat (1) and (2) Checking the Power System.
YES
Set the AE selector unit to MANUAL.
Checking Trigger switch from lens.
C-6 = Over 4V?
NO
Poor contact of AE contact pin base plate with body.
YES
(1) Set the shutter speed dial to 1 sec.
(2) Depress the shutter release button while measuring voltage of P-7.
(3) Eliminate the short-circuit wire between C-10 and C-11.
Is P-7 0V for 1 second?
NO
(1) Poor connection between lens and body.
(2) Poor connection between body and AE Finder.
(3) Trigger switch in lens is defective.
(4) Breakage of blue lead wire between AE contact pin base plate and AE main circuit in Fig. 2.
YES
(1) Return AE selector unit to A.
(2) Short-circuit 3 points C-10, C-11 and C-12.
(3) Charge the shutter.
Proceed to (6) Checking the AUTO Exposure System.

## (5) Checking the AUTO Exposure System

( Use the soldering iron and disconnect the green lead wire at A-3, on the ASA base plate unit, in Fig. 1. )




Continued from (3) Checking AUTO Exposure System

**Checking the ASA dial.**

Is the resistance between A-3 and A-2 on the ASA base plate unit, in the right drawing, 1.4 kiloohm?

NO → ASA dial circuit board is defective. → (1) Exchange the ASA dial circuit board.

YES

Does the resistance between A-1 and A-3, in the right drawing, change in the range 0 to 1.4 kiloohm when the ASA film speed is changed?

NO → ASA Dial brush is defective. → (1) Increase contact pressure of brush. (2) Clean the pattern on the ceramic base, as well as the brush. (3) Reassemble the ASA base plate unit correctly.

**Note:** Auto-exposure action will not be possible if the brush and pattern are not in contact even at one ASA film speed setting.

YES

**Checking f/numbers.**

*1
Does the resistance between P-13 and P-9 on the AE main circuit change in the range 200 ohms to 1.4 kiloohm, when the F/number is changed?
(F2.8 = 1.4 kiloohm; F22 = 200 ohms.)

NO → (1) Poor connection of the AE contact pin base plate. (2) Poor contact of lens connector. (3) Breakage of the white lead wire in Fig. 2. (4) Breakage of the black lead wire in Fig. 2. (5) Defective lens.
→ (1) Eliminate looseness in the AE contact pin base plate and lens connector, by reattaching correctly. (2) Clean contacts of the contact pin base plate and connector. (3) Exchange the lens.

YES

**Check & adjust ASA film speeds & f/numbers.**

*1
Does resistance between P-9 and P-14 change in the range 3.6 kiloohms to 200 ohms, when the F/number is changed?
(1 step in the F/number is 200 ohms.)

NO → Defective VR4. → Exchange the AE main circuit.

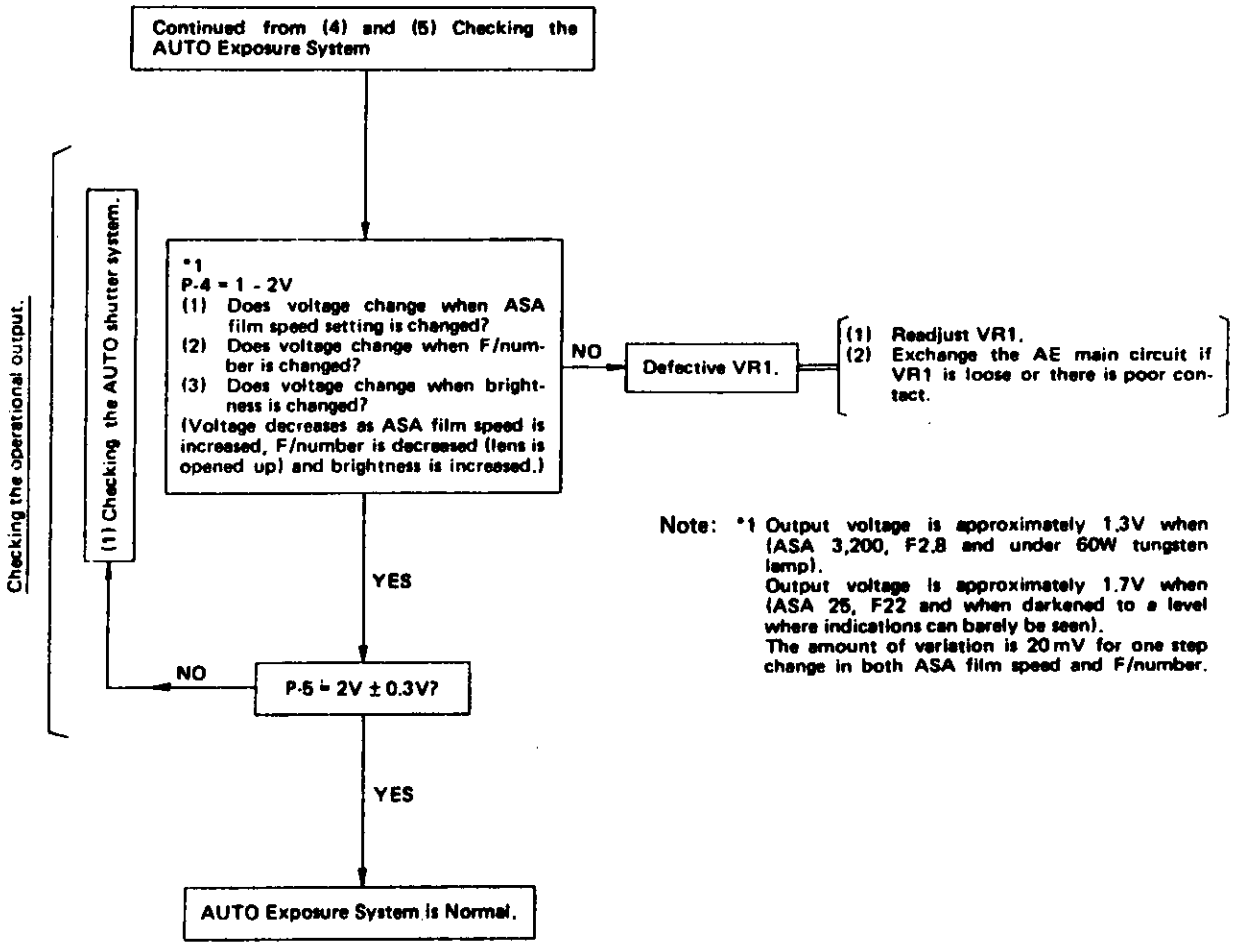
YES

Proceed to (6) Checking the AUTO Exposure System.

**Note:** Changes in the resistance reading in approximately 200 ohm steps will be satisfactory within the indicated range, when the operations noted in *1 are undertaken.
It will not be necessary to take readings for every step.

**Note:** (Resolder the green lead wire A-3-1 to the ASA base plate unit at A-3, upon completing the measurements.)

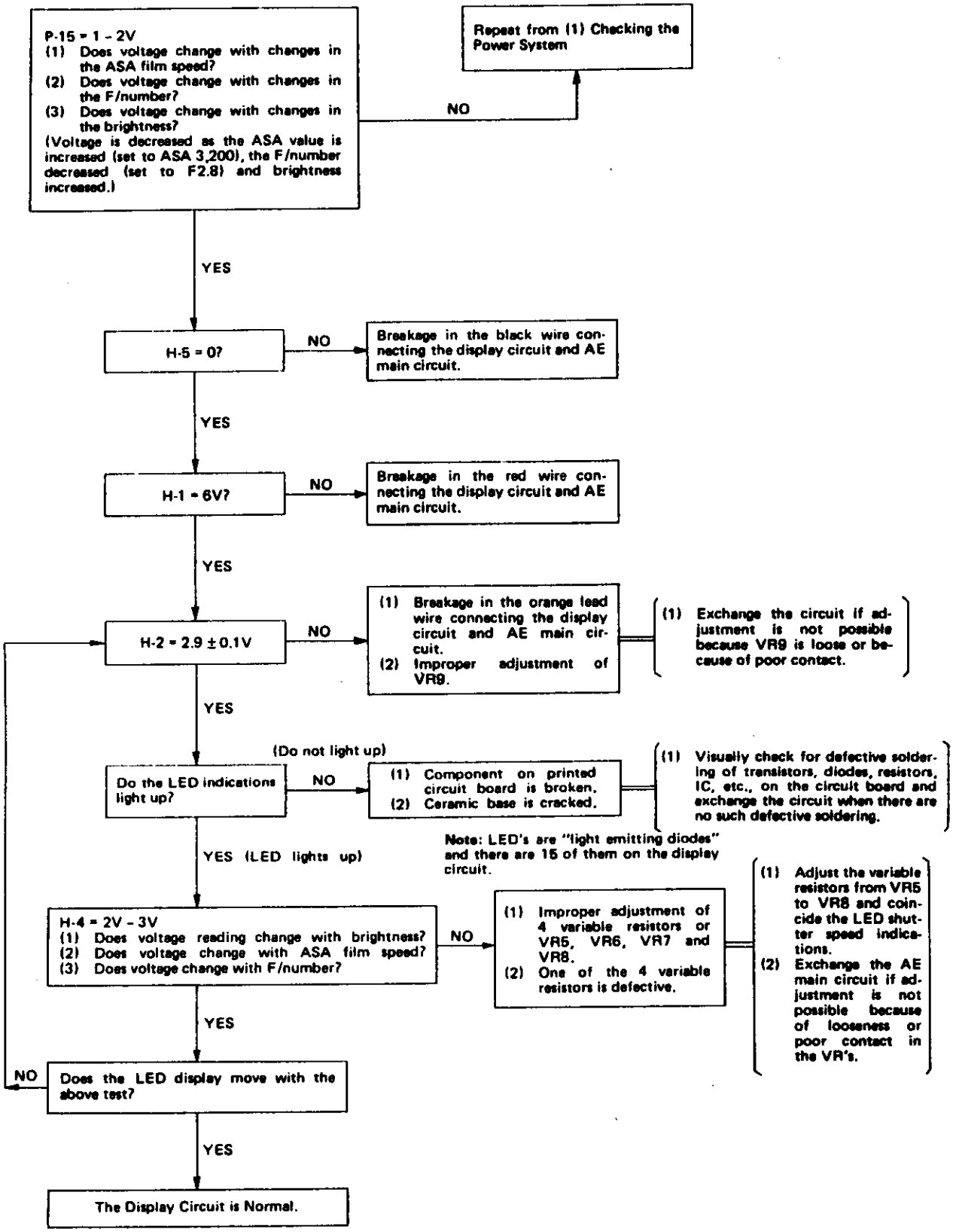
## (6) Checking the AUTO Exposure System


Continued from (4) and (5) Checking the AUTO Exposure System
Checking the operational output.
(1) Checking the AUTO shutter system.
*1
P-4 = 1 - 2V
(1) Does voltage change when ASA film speed setting is changed?
(2) Does voltage change when F/number is changed?
(3) Does voltage change when brightness is changed?
(Voltage decreases as ASA film speed is increased, F/number is decreased (lens is opened up) and brightness is increased.)
NO
Defective VR1.
(1) Readjust VR1.
(2) Exchange the AE main circuit if VR1 is loose or there is poor contact.
YES
NO
P-5 ≒ 2V ± 0.3V?
YES
AUTO Exposure System is Normal.

Note: *1 Output voltage is approximately 1.3V when (ASA 3,200, F2.8 and under 60W tungsten lamp).
Output voltage is approximately 1.7V when (ASA 25, F22 and when darkened to a level where indications can barely be seen).
The amount of variation is 20 mV for one step change in both ASA film speed and F/number.

## (7) Checking the Display System

Note: C-10, C-11 and C-12 should be short-circuited and the AE selector unit should be set to A.


P-15 = 1 - 2V
(1) Does voltage change with changes in the ASA film speed?
(2) Does voltage change with changes in the F/number?
(3) Does voltage change with changes in the brightness?
(Voltage is decreased as the ASA value is increased (set to ASA 3,200), the F/number decreased (set to F2.8) and brightness increased.)
NO
Repeat from (1) Checking the Power System
YES
H-5 = 0?
NO
Breakage in the black wire connecting the display circuit and AE main circuit.
YES
H-1 = 6V?
NO
Breakage in the red wire connecting the display circuit and AE main circuit.
YES
H-2 = 2.9 ±0.1V
NO
(1) Breakage in the orange lead wire connecting the display circuit and AE main circuit.
(2) Improper adjustment of VR9.
(1) Exchange the circuit if adjustment is not possible because VR9 is loose or because of poor contact.
YES
(Do not light up)
Do the LED indications light up?
NO
(1) Component on printed circuit board is broken.
(2) Ceramic base is cracked.
(1) Visually check for defective soldering of transistors, diodes, resistors, IC, etc., on the circuit board and exchange the circuit when there are no such defective soldering.
YES (LED lights up)
Note: LED's are "light emitting diodes" and there are 15 of them on the display circuit.
H-4 = 2V - 3V
(1) Does voltage reading change with brightness?
(2) Does voltage change with ASA film speed?
(3) Does voltage change with F/number?
NO
(1) Improper adjustment of 4 variable resistors or VR5, VR6, VR7 and VR8.
(2) One of the 4 variable resistors is defective.
(1) Adjust the variable resistors from VR5 to VR8 and coincide the LED shutter speed indications.
(2) Exchange the AE main circuit if adjustment is not possible because of looseness or poor contact in the VR's.
YES
NO
Does the LED display move with the above test?
YES
The Display Circuit is Normal.

## Adjustment of the Exposure at the Film Plane

In addition to the AE Finder and ETR camera body, it will also be necessary to use the 75mm Zenzanon-E lens, a VR adjusting driver, an EE Camera Tester (Model ST-7081) or equivalent and either battery or voltage regulator.
Attach the AE Finder to the ETR body, as well as lens to the body, insert battery or connect the voltage regulator, etc., and adjust the exposure at the film plane, in the following manner:—

(1) Set conditions to ASA 100, LV 11 and F8.
Rotate VR4 and adjust to get exposure tolerance within ±0.05EV.
Clockwise rotation . . . . . EV minus (-) direction.
Counter-clockwise rotation . . . EV plus (+) direction.
(2) Set conditions to ASA 100, LV 15 and F11 (1/250 sec.).
Check whether exposure is within ±0.3 EV.
(3) Set conditions to ASA 100, LV 7 and F8 (1/2 sec.).
Check whether exposure is within ±0.3 EV.
(4) Set conditions to ASA 3,200 LV 7 and F8 (1/60 sec.).
Confirm whether exposure is within ±0.5 EV.

NOTE:
If adjustments are not possible to the limits specified for the conditions noted for (2) and (3), after adjusting to zero EV (0 EV) under conditions specified for (1), then adjust by revolving VR2. However, in this case, alternate adjustments under conditions specified for (1) and (2). If, in the same manner, adjustments are not possible to the limit specified for the condition noted in (4), adjust by revolving VR3. If (1) is 0 EV and (4) is a +EV, in this case, revolve VR3 counter-clockwise.
If (1) is 0 EV and (4) is a -EV, revolve VR3 clockwise.

## Adjustment of the LED Display Indications

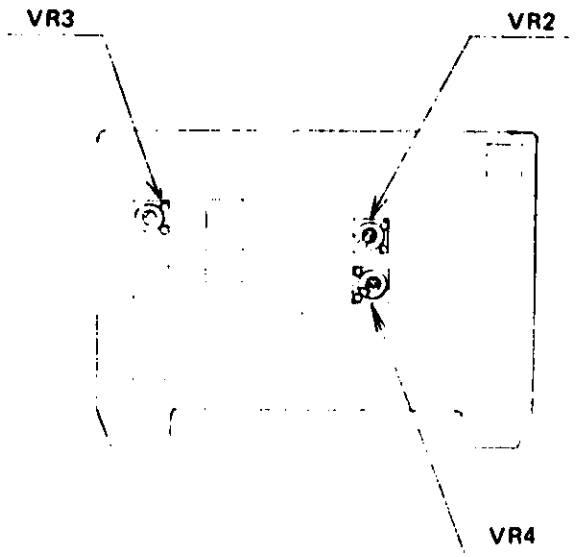
The following adjustments must be made after completing adjustment of the exposure at the film plane, as otherwise the display indications may not be correct.
In addition to the AE Finder on the ETR body, adjustments will also require the 75mm Zenzanon-E lens, a VR adjusting driver, an EE Camera Tester (Model ST-7081) and either battery or voltage regulator, in the same manner as for the previous adjustment.

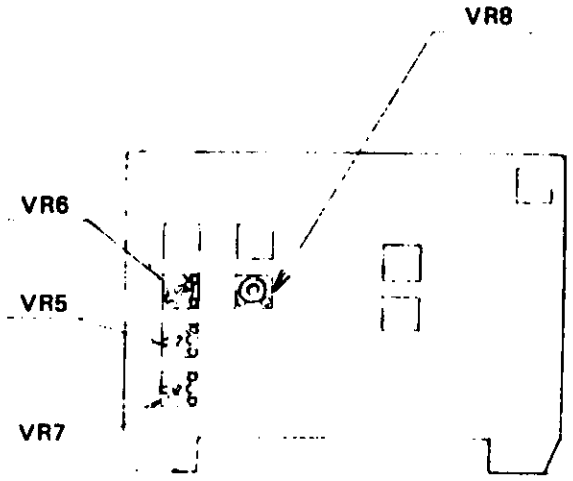
(1) Set conditions to ASA 100, LV 7 and F8.
Revolve VR6 and coincide the LED shutter speed indication to "2" when the display button is depressed.
(2) Set conditions to ASA 100, LV 11 and F8.
Revolve VR7 and coincide the LED indication to "30".
(3) Set conditions to ASA 100, LV 15 and F8.
Confirm that the LED indication is "500", when the display button is depressed.

NOTE:
Should "250" or the over-exposure (▶) mark appear in the case of (3), after the adjustments for (2) have been made as above, then revolve VR8 and adjust so that the LED indications for (2) and (3) are "30" and "500" respectively.

(4) Set conditions to ASA 100, LV 4 and F8 confirm that the LED indications is "4S".
(5) Set conditions to ASA 3,200, LV 4 and F8 and confirm that "8" is displayed.
(6) Finally, confirm that the LED indication is "8" when conditions are ASA 100, LV 9 and F8 and "4" when conditions are ASA 50, LV 9 and F8.

NOTE:
If the above LED indications do not appear when the display button is depressed, then revolve VR5 for making the appropriate adjustments.



## 1. Winding is not Possible

Strip off the winding lever cover leatherette (A230970) and winding lever cover (A230250) and tighten the exposed fixing screw (A230261, which is a left hand screw). (When tightening the fixing screw, hold the winding connector which couples with the film winding crank on the camera body.) If winding is possible with the winding lever (A730030), then undertake the following repair:–

1) Take off the winding lever by loosening four B813407 screws.
2) Loosen the three B893307 screws and detach the speed grip top plate (A230220).
3) Since the winding claw (#1) of the winding wheel (A730050) is riding on the wind-stopper ratchet (#2), in this case, loosen the fixing screw (A230261) and then press on the part indicated as A, in the drawing, so that the winding claw (#1) catches the wind-stopper ratchet teeth. (This operation should be undertaken without detaching the winding wheel, or in the condition shown in Fig. 2.)
4) Apply Loc-Tite to the fixing screw (A230261) and screw it in securely.
5) If the winding wheel is loose in the vertical direction, adjust with washers (B530211).

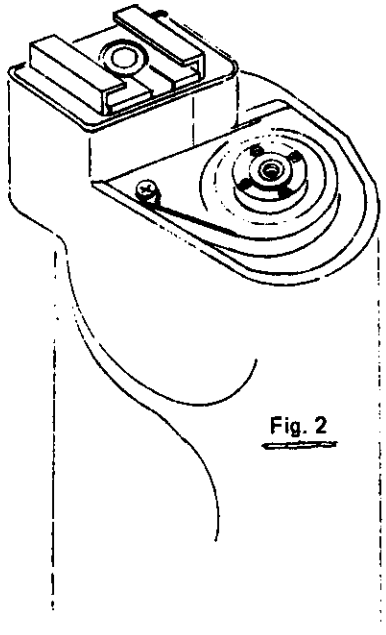


Fig. 2

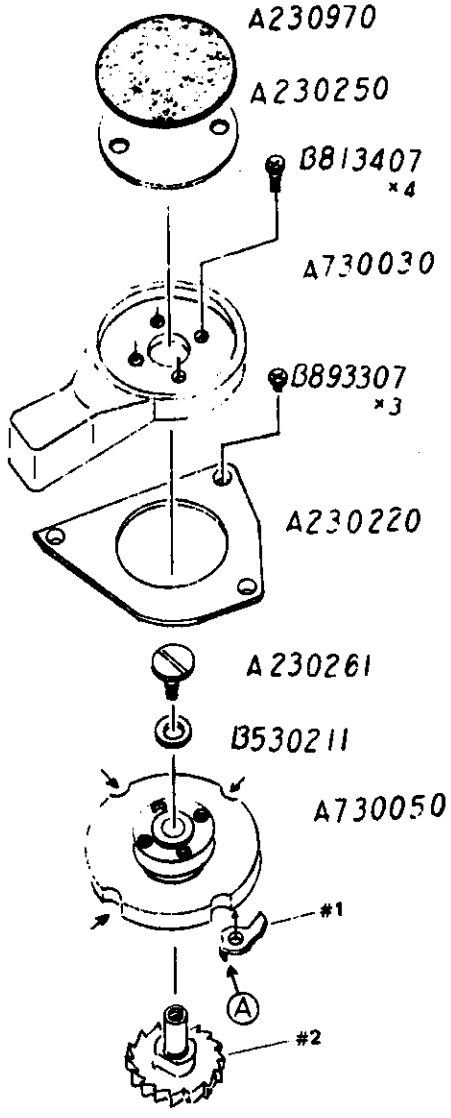



Fig. 1

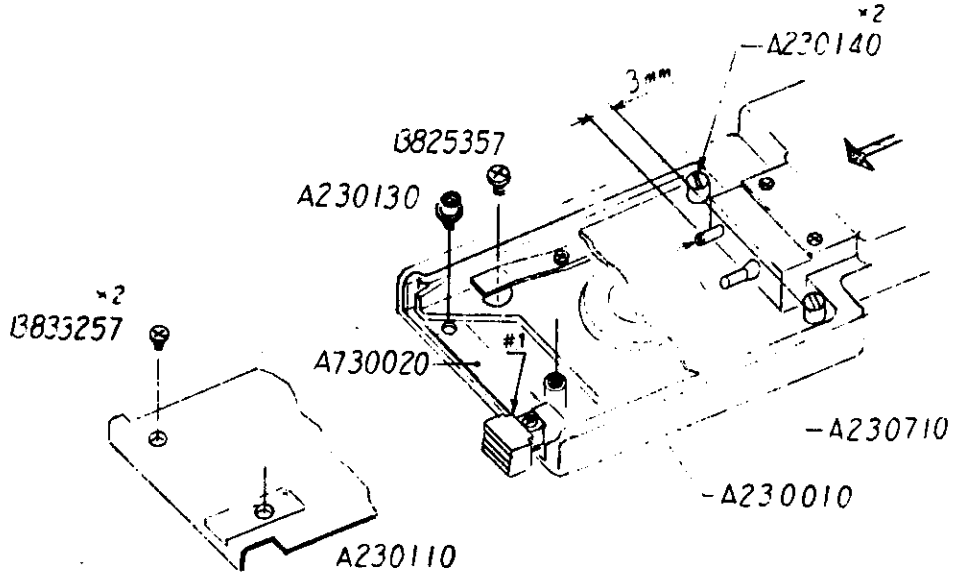
## 2. Release Action is not Possible

Check in the following manner:

1) See whether the release pin (A230710) extends 3 mm more than the upper stopper pin (A230140). (If extension is insufficient, take off the bottom plate (A230790), loosen the release pin fixing screw (B813227) and then screw in release pin B(A230720) sufficiently to extend the release pin (A230710) the required amount. See page 4.)
2) Attach the Speed Grip to the camera body, without locking it. Next, push the Speed Grip towards the camera body or in the arrow-indicated direction in the drawing. If release action is possible, in this case, the stopper plate is loose with the result that the Speed Grip is away from the camera body and the release stroke is not long enough.

Repair as follows:—

1) Loosen two B833257 screws and two stopper pins (A230140) and take off the base plate (A230110). The stopper (#1) should be pushed down, when detaching the base plate.
2) Exchange the safety stop (A230100, #1) if its edge is rounded. Then retighten B825357 and A230130 screws.



## 3. Flash Synch is not Possible

1) The synch connector pin (#1) is not extended up to 6 mm from the stopper pin (#2) and, therefore, is not in contact with the camera body.

Repair as follows:—

The connector pin (#1) is insert-molded in the new contact base (A230772) and, therefore, cannot slip out.

a) Loosen two B815457 screws and detach the contact base.
b) Disconnect the green-colored wire which is connected to the old connector pin (#1) and connect it to the new contact base, when making the exchange.

2) If continuity does not exist between the connector pin (#1) and the accessory shoe contact pin (#3), when tested, then —
   a) Loosen two B815457 screws of the contact base and check connection of the connector pin (#1) and the green-colored lead wire. If disconnected, re-solder properly.
   b) Pull out the accessory shoe base plate (A230810), loosen four B893457 screws and take off the accessory shoe mount (A230800). Pull up the contact pin (#3) slightly and check connection of the contact ring (#4) and the green-colored lead wire. If disconnected, re-solder. If the nut (B410057) is loose, the contact pin (#3) and contact ring (#4) will not contact and, therefore, the nut should be tightened strongly, too.
3) When continuity does not exist between the accessory shoe mount (A230800) and the pressure plate (A230040), then —
   a) Loosen two B833257 screws and two stopper pins (#2), take off base plate (A230110) and check connection of #5 and the black-colored wire. If connected, re-solder properly.
   b) Next, detach the accessory shoe mount and check connection of #6 and the black-colored lead wire. Re-solder if disconnected.

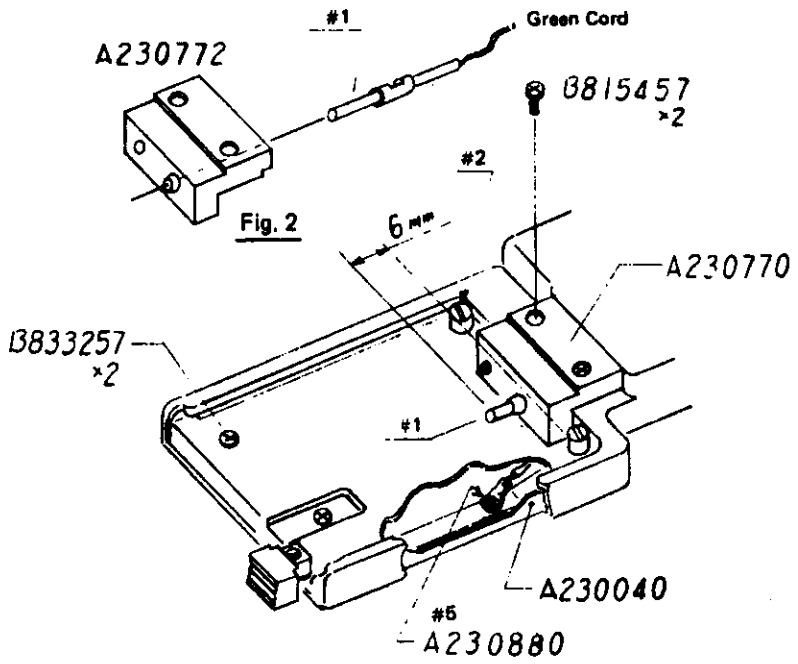



Fig. 2

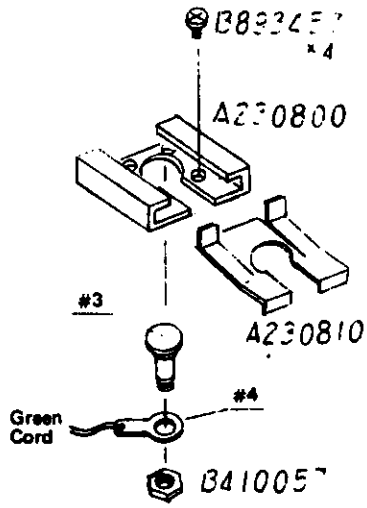
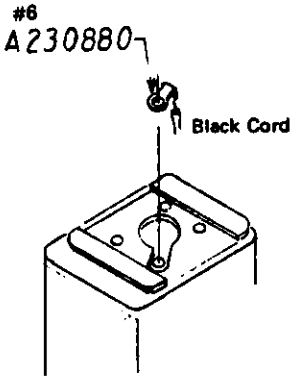
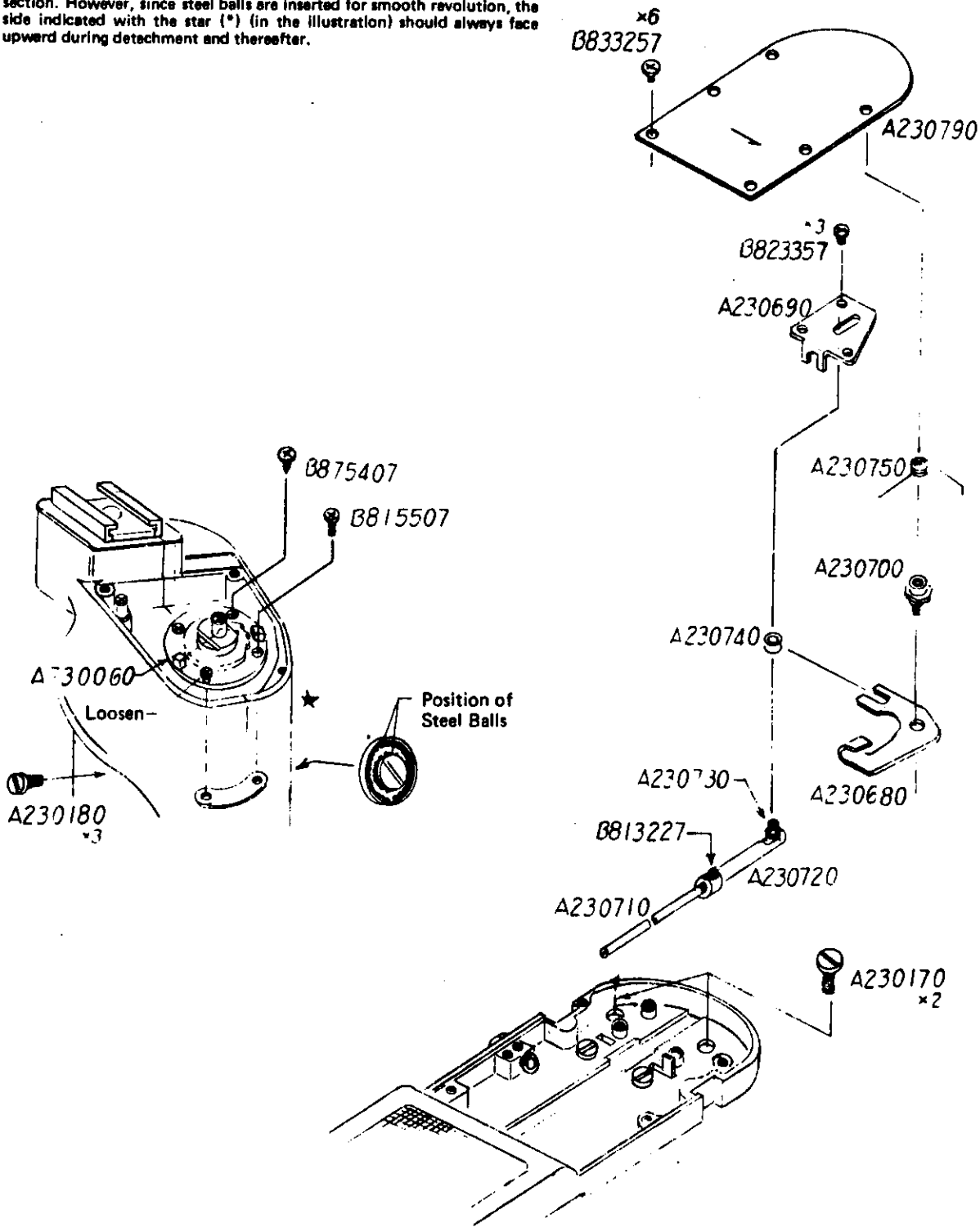



Fig. 3



## 4. Disassembling the Grip Section

1) Unscrew six B833257 screws and detach the bottom plate (A230790).
2) Unscrew three B823357 screws and detach the release pin guide (A230690).
3) Detach spring A230750, take out crank B shaft (A230700) and then take out the crank B (A230680).
4) Unscrew two A230170 screws.
5) Detach parts up to the winding wheel (A730050), as per instructions on page 1.
6) Of the four setscrews fixing the winding shaft holder base (A730060), unscrew two and loosen one.
7) Unscrewing the three A230180 screws will permit detachment of the grip section. However, since steel balls are inserted for smooth revolution, the side indicated with the star (*) (in the illustration) should always face upwerd during detachment and thereafter.